

REMARKS

Claim 1 has been amended to specify that the plasma treatment is a nitrogen plasma treatment. Basis for this limitation may be found on page 21, last paragraph through page 22, first paragraph and the examples in the specification. No new matter has been added into the amended claim.

REQUEST FOR RECONSIDERATION

Claims 1-22 are active in the case.

The rejection of Claims 1-3, 6, 7, 9, 10, 12, 13 and 15-17 under 35 U.S.C. §103(a) as unpatentable of Watanabe et al in view of Swisher is traversed.

As admitted by the Examiner on page 4 of the Official Action, Watanabe et al does not teach a molded resin article that has had its surface activated by plasma treatment. Another distinction of the present invention over Watanabe et al is that Watanabe et al select the type of filler, the quantity of filler, and the shape of the filler to control substrate reflection in the element of Watanabe et al. In contrast, the present invention selects filler, quantity of filler and shape of filler to improve adhesion between the insulating substrate containing the filler and a metal layer deposited thereon.

Swisher show the treatment of a resin layer surface with plasma to improve the adhesion of metal thereto, but uses only oxygen plasma and not nitrogen plasma, as in the present invention and, further, does not use filler in the resin layer subjected to the oxygen plasma treatment of Swisher. Therefore, Swisher does not cure the deficiencies of Watanabe et al, because a significant feature of the present invention is the use of inorganic filler in the substrate together with a nitrogen plasma treatment to improve adhesion of deposited metal on the surface of an insulating substrate. Therefore, the references do not provide a prima facie case of obviousness and the claims distinguish over the combination of references.

Even if the Examiner maintains the rejection, Applicants provide herewith a Declaration under 37 C.F.R. §1.132 demonstrating the superiority of adhesion of metal deposited on insulating substrates containing various amounts of filler within the range of the present claims, when the insulating substrates are treated by nitrogen plasma, as compared to the same substrates treated by oxygen plasma or argon plasma.

Table 1 in the Declaration under 37 C.F.R. §1.132 shows three different base resins having filler material in two different amounts within the range of the present claims treated by nitrogen plasma, oxygen plasma, and argon plasma, respectively. In the case of each base resin with filler, treatment with nitrogen plasma demonstrated superior results in adhesion between deposited metal and the plasma treated surface of the base resin with filler from a range of 6% greater adhesion up to 220% greater adhesion, as compared to same resins with filler treated by oxygen plasma and argon plasma. Therefore, it is clear that nitrogen plasma treatment of a base resin containing filler material according to Claim 1 produces superior adhesion between the base resin and deposited metal, as compared to a base resin with filler material treated by oxygen plasma or argon plasma. The claims distinguish over the combination of references for this reason, also.

The rejection of Claims 1-3, 5, 6, 8 and 9 under 35 U.S.C. §103(a) as unpatentable over Inoue et al in view of Swisher is traversed.

The arguments made above in the response to the rejection over Watanabe et al in view of Swisher are equally applicable to the rejection over Inoue et al in view of Swisher, since Inoue et al does not teach plasma treating of the surface of a molded resin article, as was the case with Watanabe et al, and that Swisher only uses oxygen plasma treatment and does not use filler in the resin, as argued above.

Further, the arguments with respect to the showing of superiority of adhesion of deposited metal on base resins with filler material treated by nitrogen plasma, as compared to

treatment with oxygen plasma and argon plasma, are equally applicable here and the superiority of adhesion distinguishes the claims over the combination of references.

The rejection of Claims 4 and 11 under 35 U.S.C. §103(a) as unpatentable over Watanabe et al in view of Swisher and Bersted et al is traversed.

Bersted et al do not cure the deficiencies of the combination of Watanabe et al and Swisher, because Bersted et al is only cited only for the teaching that a co-polyamide such as polyphthalamide is suitable for use in a flame retardant molded composition. The claims distinguish over the combination of references.

The rejection of Claim 14 under 35 U.S.C. §103(a) as unpatentable over Inoue et al in view of Swisher and Freeman et al is traversed.

Freeman et al does not cure the deficiencies of the combination of Inoue et al and Swisher, because Freeman et al is cited only for the teaching of a method for manufacturing kaolin clay particles to provide reinforcement properties, when added into polymer compounds. The claims distinguish over the combination of references.

The rejection of Claims 1, 18 and 19 under 35 U.S.C. §103(a) as unpatentable over Okada et al in view of Kobayashi et al and Machii et al is traversed.

Neither Okada et al nor Kobayashi et al show treatment of an insulating substrate containing filler with nitrogen plasma in order to improve the adhesion between a deposited metal and the insulating substrate with filler. The Examiner attempts to remedy this deficiency by citing Machii et al, column 8, lines 42-59, and states that plasma treating a resin material such as polyester is known to increase the adhesion of a metal layer to the resin via heat bonding. However, it is clear from a reading of column 8, lines 42-59 of Machii et al that the plasma treatment is carried out only to improve adhesion between resin layers in laminate film and not to improve adhesion between a deposited metal layer and a resin layer. Therefore, the claims distinguish over the combination of references.

Further, the superior results shown in the Declaration under 35 C.F.R. §1.132 and discussed above in the response to the rejection over Watanabe et al in view of Swisher demonstrates the superiority of adhesion between resin layers containing filler and treated by nitrogen plasma treatment and a deposited metal layer, as compared to treatment of the same layers with oxygen plasma or argon plasma. Therefore, the claims distinguish over the combination of references.


The rejection of Claims 1 and 20-22 under 35 U.S.C. §103(a) as unpatentable over Inoue et al in view of Kobayashi et al, Matsushita and Swisher is traversed.

The arguments made above with regard to the rejection over Watanabe et al in view of Swisher are equally applicable here and the secondary references to Kobayashi et al and Matsushita do not cure the deficiencies of the above combination. Therefore, the claims distinguish over the combination of references.

It is submitted that Claims 1-22 are allowable and such action is respectfully requested.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.



Norman F. Oblon
Attorney of Record
Registration No. 24,618

Roland E. Martin
Registration No. 48,082



22850

Tel.: (703) 413-3000
Fax: (703) 413-2220

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MARKED-UP COPY OF AMENDMENT

IN THE CLAIMS

--1. (Amended) A laminate comprising a metal layer which covers the surface of an insulating substrate, which substrate is activated by nitrogen plasma treatment and which metal layer is formed on said substrate by sputtering, vacuum depositing or ion plating, wherein said substrate is obtained by molding a resin composition containing 20 to 150 parts by mass of a fibrous filler having an average fiber diameter of 0.1 to 5 μm and an average fiber length of 10 to 50 μm relative to 100 parts by mass of a base resin is a thermoplastic resin or a thermosetting resin or a mixture thereof.--